

# Chapter 5

## Marketplace Solutions

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Marketplace solutions to airport capacity problems are those that rely primarily on competitive, free-market influences. Some examples, which are discussed below, are the development of new hub airports, the expanded use of existing commercial service airports, the expanded use of reliever airports, and the re-allocation of hourly distribution of demand to reduce demand peaks. Marketplace solutions involve the interests of the airlines, local government and airport authorities, and local communities; both local and national economic factors are involved. This diversity of interests makes predicting and managing these solutions inherently difficult.

### 5.1 New Hubs at Existing Airports

It is reasonable to assume that as flight delays grow at traditional connecting hub airports, airlines will develop new hubs at existing airports. Hub airports developed since airline deregulation have exhibited the following characteristics:

- Strong origin/destination market,
- Good geographic location,
- Expandable airport facilities,
- Multiple IFR arrival capability,
- Strong economy and availability of balanced work force, and
- Ability to accommodate existing/planned service.

More than two dozen potential new hub airports more than 50 miles from airports with forecast delay problems and with sufficient potential runway capacity to accommodate significantly increased airport operations have been identified. Each has the potential to permit multiple approach streams during IFR conditions. Hence, they meet the first, second, and fourth characteristics. Other airports may meet the third and fourth characteristics through appropriate capital investment. Additional analysis is required to determine which airports have viable economies both from the local and airline perspective, as well as local support for expansion into a hub airport.

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An example of the type of analysis that may be performed to determine the potential consequences of establishing a new hub airport is given for Sacramento Metropolitan airport (SMF). A new connecting hub at Sacramento could produce delay savings by diverting some of the growth that would otherwise occur at San Francisco International (SFO).<sup>1</sup> The following figures illustrate the potential effect on delays at San Francisco in some future period assuming no change in the role Sacramento presently plays in the system. This situation is then compared to a hypothetical one in which Sacramento has become a new connecting hub airport and handles some of the traffic growth that would have connected at San Francisco. Specifically, it assumes that 200 daily operations (100 arrivals and 100 departures) are relocated as a result of establishing a new connecting hub at Sacramento. That number of flights would be “diverted” from the future growth at San Francisco.

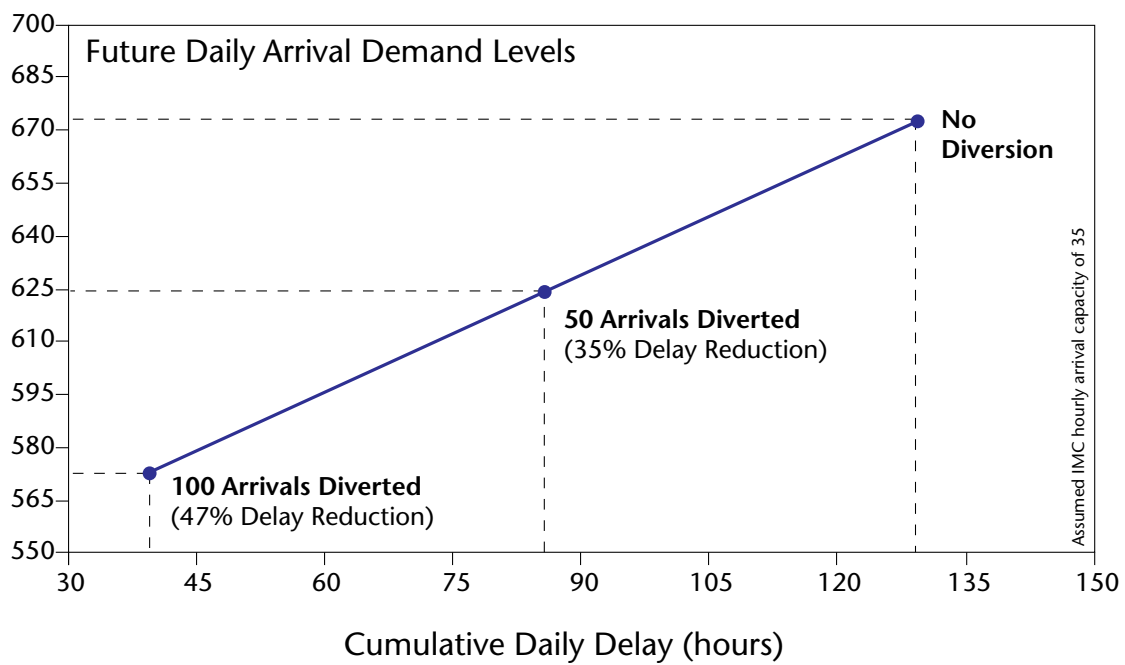
FAA forecasts of 1998 demand are used in the analysis. As Figure 5-1 shows, demand at San Francisco is estimated as 673 daily arrivals. This level of activity results in a cumulative level of daily flight delay of 129 hours. If, as a result of Sacramento’s potential new hub status, 100 daily arrivals (200 operations) were shifted from future growth at San Francisco to Sacramento, the forecast daily delay at San Francisco would be reduced 90 hours to 39 hours, a 70 percent delay reduction. A diversion of 50 daily arrivals (100 operations) would result in a reduction of 45 hours of forecast daily delay to 84 hours, a 35 percent reduction.

This analysis assumes an hourly arrival capacity of 35 flights per hour at San Francisco under Instrument Meteorological Conditions (IMC). Figure 5-2 shows the relationship between capacity and delay at San Francisco for various arrival capacities. The figure indicates a proportional decrease in benefits if arrival capacity grows (through the use of new approach procedures or new runway layouts). For example, an IMC hourly arrival rate of 40 would result in a daily delay of 15 hours, while an hourly arrival rate of 45 would result in a daily delay of 8 hours. At levels above 45 hourly arrivals, the capacity-delay curve indicates only small improvements in daily delay.

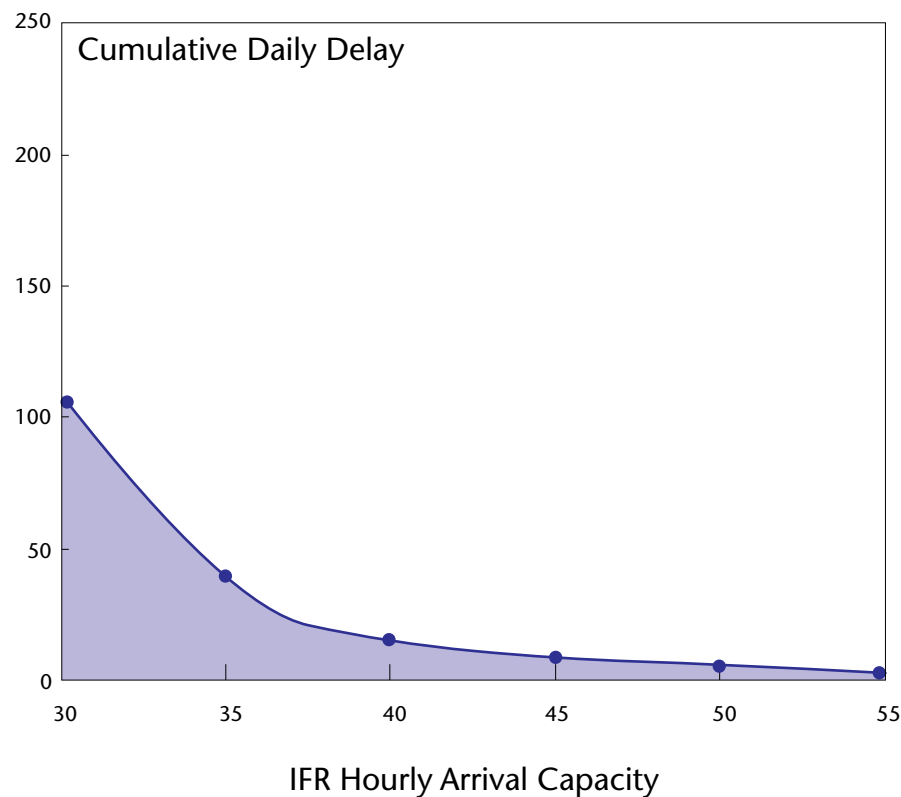
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1. *A Case Study of Potential New Connecting Hub Airports, Report to Congress*. The other airports described in that study are Huntsville International Airport, Port Columbus International Airport, and Oklahoma City.

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**Figure 5-1. Total Delay for Varying Arrival Demand at San Francisco (SFO)**



**Figure 5-2. Capacity Delay Curve for San Francisco (SFO) Assuming a New Connecting Hub at Sacramento**

## 5.2 New Airports as Hubs

Construction of new airports that would primarily serve as transfer points for passengers flying to and from other airports is being discussed and studied. These new airports could serve to decentralize air service at traditional connecting hub airports and reduce flight delays. Economic, social, and air traffic control factors will help determine if, where, and how fast such “new generation” airports are developed. For example, one factor in siting a new airport might be its impact on existing air traffic patterns. Figure 5-3 shows actual flight tracks for a representative sample of all commercial and general aviation IFR flights within the contiguous United States over a 24-hour period in early 1991. Areas of low traffic density could be investigated further as potential sites for “new generation” airports. Similar studies could be performed for selected regions of interest.

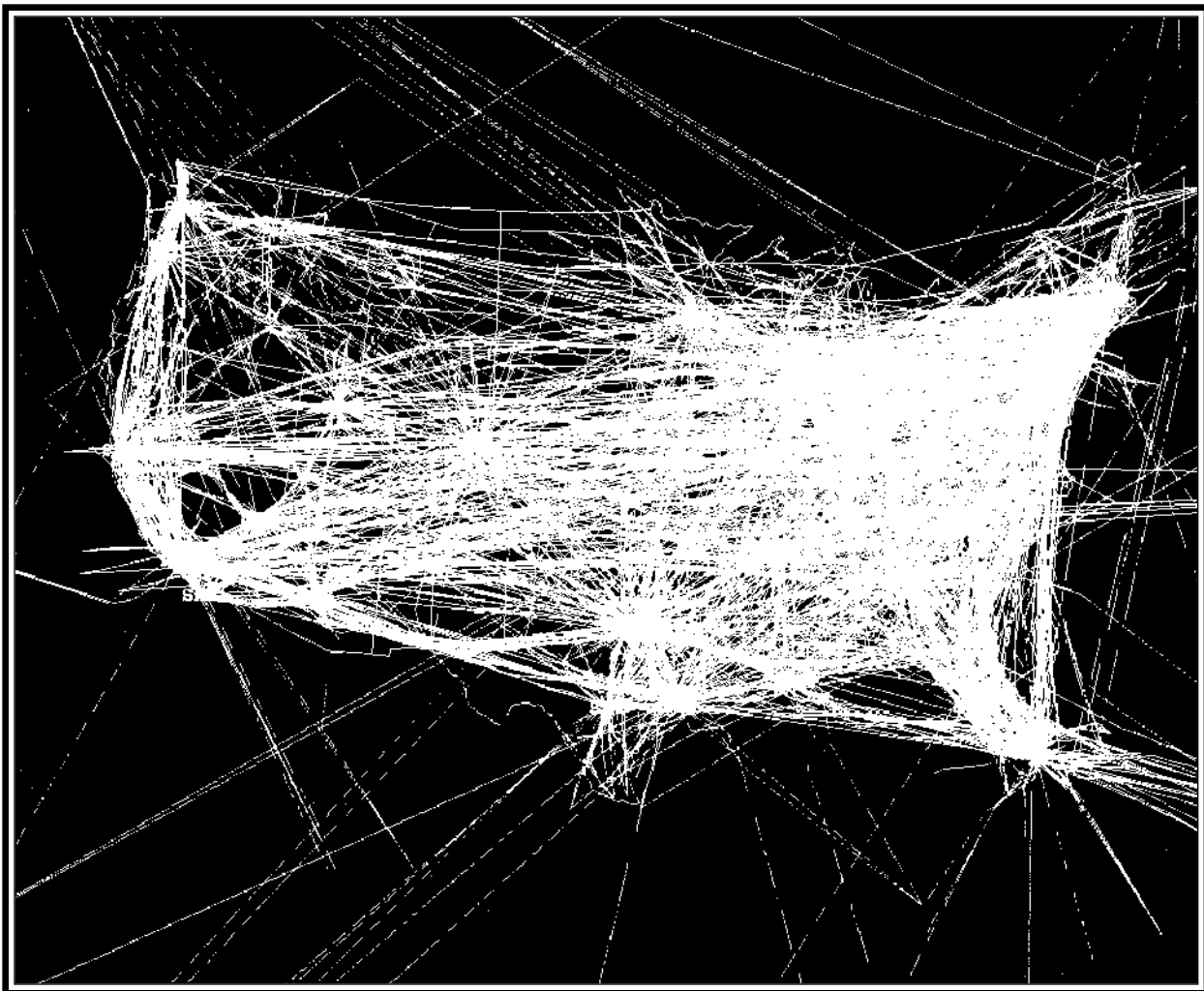
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Construction of new airports to primarily serve as transfer points is being studied.

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**Figure 5-3. Ten Percent of IFR Flight Tracks Within the Contiguous United States Over a 24-Hour Period**

### 5.3 Expanded Use of Existing Commercial Service Airports

Expanded use of existing commercial service airports can ease capacity problems at nearby primary airports by spreading commercial aircraft operations among additional airports near the primary airport.

In contrast to new hubs, the expanded use of existing commercial service airports is primarily intended to relieve congestion in a particular market, not to constitute a market of its own.

For each of the 23 current delay-problem airports, a preliminary list of airports located within 50 miles (or as close as possible) and served by commercial air traffic, was compiled. This is shown in Table 5-1. A number of military airports were added to the list. As congestion becomes greater at the delay-problem airports, passengers may choose to travel to the alternative airports. This traffic diversion would tend to decrease delays at the delay-problem airport.

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Existing commercial service airports within 50 miles of current delay-problem airports may provide relief for some of the delay problems.

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### 5.4 Expanded Use of Reliever Airports

Reliever airports ease capacity problems at primary airports by spreading aircraft operations over additional airports near the primary airports. In contrast to the expanded use of commercial service airports, reliever airports are used mainly by smaller general aviation aircraft, while the primary and other commercial use airports serve mostly larger, commercial service aircraft. The segregation of aircraft operations by size increases effective capacity at each airport type because required time and distance separations are reduced between planes of similar size.

The FAA provides assistance for construction and improvements at reliever airports under the Airport Improvement Program. The objective of this assistance is to increase utilization of reliever airports by building new relievers, improving the facilities and navigational aids at existing relievers, and reducing the environmental impact on neighboring communities. Because they serve primarily general aviation aircraft, reliever airports can be effective with significantly less extensive facilities than commercial service airports.

Reliever airports can be expected to play significant roles in reducing congestion and delay at delay-problem airports, especially those where general aviation constitutes a significant portion of operations.

Of the 40 airports forecasted to exceed 20,000 hours of annual aircraft delay in 2000 without further improvements, about one third have 25 percent or more general aviation operations.

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Increased use of reliever airports by smaller general aviation aircraft would relieve some of the congestion at the larger, primary airports.

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**Table 5-1. A Preliminary List of Airports Located Within 50 Miles of the 23 Delay-Problem Airports**

Delay-problem Airport <sup>2</sup>	Airport Code	Supplemental Airport	Delay-problem Airport <sup>2</sup>	Airport Code	Supplemental Airport
Chicago O'Hare	ORD	Aurora Rockford Wheeling Gary, IN Glenview NAS	St. Louis	STL	—
Atlanta Hartsfield	ATL	Athens Macon Columbus (100 mi) Chattanooga, TN	Phoenix	PHX	Prescott (80 mi)
Dallas-Ft. Worth	DFW	Brownwood (120 mi) Killeen (100 mi) Longview (100 mi) Paris (80 mi) Temple (100 mi) Waco (80 mi) Wichita Falls (100 mi)	Miami	MIA	Ft. Lauderdale
Los Angeles	LAX	Burbank Irvine Long Beach Ontario Oxnard Palmdale San Pedro Los Angeles NAS	Philadelphia	PHL	Allentown Lancaster (70 mi) Reading (60 mi) Willow Grove NAS Trenton, NJ Wilmington, DE
Newark	EWR	Trenton White Plains, NY	Washington	DCA	Baltimore, MD Hagerstown, MD (60 mi) Charlottesville, VA (100 mi) Richmond, VA (100 mi) Andrews AFB
San Francisco	SFO	Concord Hayward Oakland San Jose Santa Rosa Moffett Field NAS Alameda NAS Hamilton AFB	Pittsburgh	PIT	Johnstown Latrobe Morgantown, WV (60 mi)
New York	JFK	Farmingdale Garden City Islip Long Island White Plains	Detroit	DTW	Flint Pontiac Lansing (80 mi) Toledo, OH (60 mi) Selfridge ANG
Boston	BOS	Bedford Burlington Lawrence New Bedford Norwood Plymouth Waltham Worcester Hanscom AFB	Orlando	MCO	Daytona Beach Ft. Pierce (100 mi) Melbourne (60 mi) Tampa (70 mi) Vero Beach (90 mi)
			Minneapolis	MSP	Mankato (70 mi) Eau Claire, WI (70 mi)
			Charlotte	CLT	Hickory Greensboro (90 mi) Winston-Salem (60 mi)
			Washington	IAD	Baltimore, MD Hagerstown, MD (60 mi) Charlottesville, VA (100 mi) Richmond, VA (100 mi) Andrews AFB
			Denver	DEN	Colorado Springs (80 mi)
			Honolulu	HNL	Kailua
			Houston	IAH	Beaumont (60 mi) Lufkin (100 mi)
			Seattle	SEA	—

2. Airports having greater than 20,000 hours of delay for 1990 as reported by FAA Office of Policy and Plans.